

Remarks/Arguments

The present amendment overcomes the objection to the claims, the rejection under 35 U.S.C. 112, and the double patenting rejection.

The rejection of the claims under 35 U.S.C. 103(a) as being unpatentable either over Morita et al, Watanabe et al or Wang et al, all in view of Nishioka et al, is respectfully traversed.

It is an object of the present invention to provide a barrier rib material which has a high strength at a low dielectric constant and which has a thermal expansion coefficient of a value substantially equal to that of a peripheral member.

The barrier rib material comprises a glass powder and a filler powder. By using a silica powder as the filler powder, the dielectric constant of the barrier rib can be lowered. By using an alumina powder as the filler powder, it is possible to increase the strength of the barrier rib material. According to the present invention, the filler powder contains both the silica powder and the alumina powder in appropriate quantities. Consequently, it is possible to achieve the above-mentioned object of the present invention, i.e., the low dielectric constant and the high strength of the barrier rib material.

Generally, the glass powder having a low melting point for use in the barrier rib material often has a high thermal expansion coefficient. The thermal expansion coefficient of the barrier rib material depends upon the thermal expansion coefficient of the glass powder, the thermal expansion coefficient of the filler powder, and a content ratio between the glass powder and the filler powder. However, according to the present invention, the silica powder used for the filler powder contains 40% to 75% by mass of a quartz glass powder having a low thermal expansion coefficient, and therefore, it is easy to adjust the thermal expansion coefficient of the barrier rib within the range of $60 \times 10^{-7}/^{\circ}\text{C}$ to $85 \times 10^{-7}/^{\circ}\text{C}$.

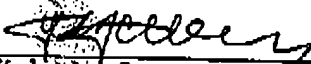
In other words, since the thermal expansion coefficient of the filler powder can be lowered, it is possible to adjust the thermal expansion coefficient of the barrier rib within the range of $60 \times 10^{-7}/^{\circ}\text{C}$ to $85 \times 10^{-7}/^{\circ}\text{C}$ by containing the glass powder having a higher thermal expansion coefficient in an appropriate quantity. As a consequence, many kinds of glass powders can be used in the barrier rib material of the present invention.

As the Examiner concedes, neither Morita et al, Watanabe et al or Wang et al teach the specific compositions of the filler powder claimed by applicants. While Nishioka et al disclose the use of silica and alumina as filler powders and, in one example, suggest the combination of an α -quartz and quartz glass as the

silica, the ratio of the α quartz having the high thermal expansion coefficient is higher than that of the quartz glass in the silica. Therefore, the ratio of α -quartz to quartz glass does not fall within the claimed ratio, that is beyond the claimed range of thermal expansion coefficient. The claimed combination of alumina powder and the specific silica powder in the claimed ranges results in a barrier rib material of high strength and a low dielectric constant.

Summarizing, the art of record does not suggest the claimed combination of components for producing a barrier rib material and, even if combined in the manner proposed by the Examiner, the claimed combination is not believed to be obvious from the references. Accordingly, favorable reconsideration and allowance of claims 1, 2 and 13 are respectfully solicited.

Respectfully submitted,
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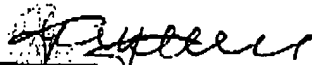

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